FIG. 1
(PRIOR ART)

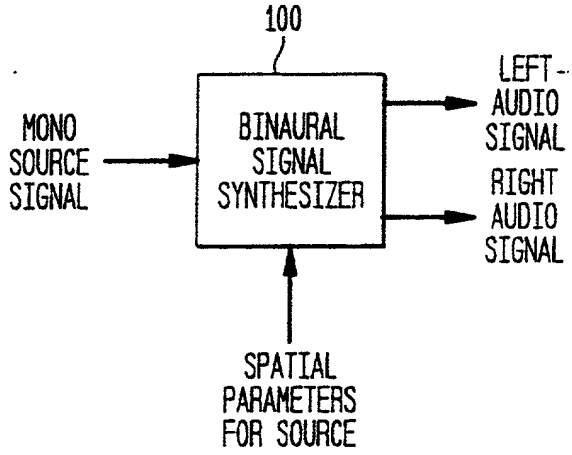


FIG. 2
(PRIOR ART)

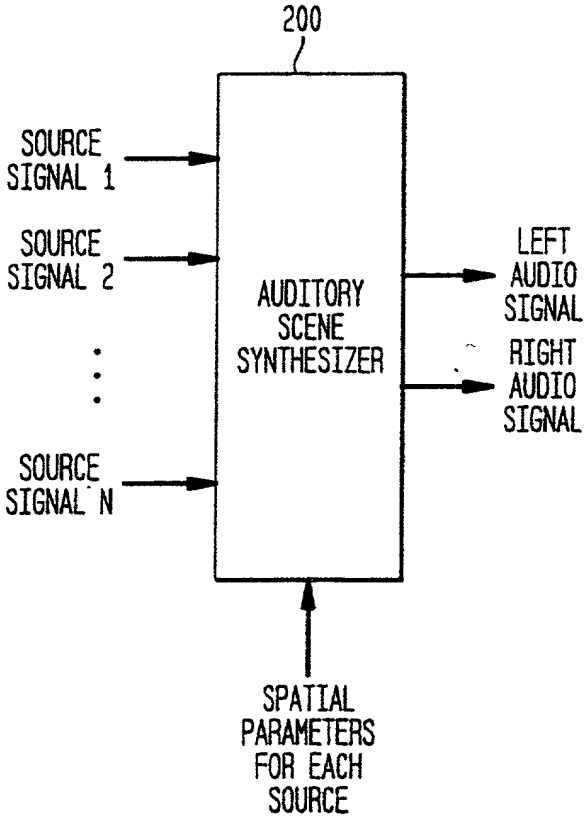


FIG. 3

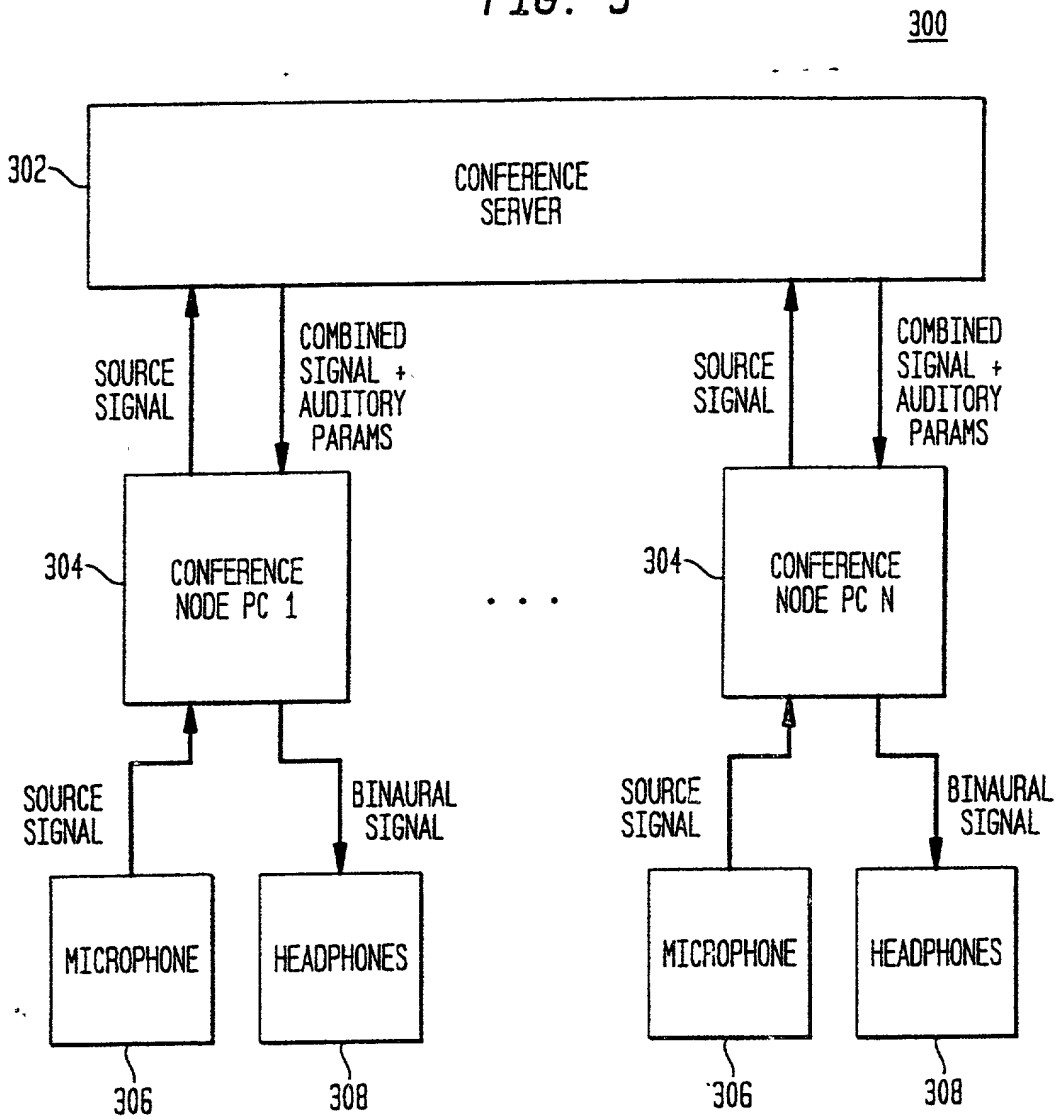

300
302
CONFERENCE SERVER
SOURCE SIGNAL
COMBINED SIGNAL + AUDITORY PARAMS
SOURCE SIGNAL
COMBINED SIGNAL + AUDITORY PARAMS
304
CONFERENCE NODE PC 1
304
CONFERENCE NODE PC N
SOURCE SIGNAL
BINAURAL SIGNAL
SOURCE SIGNAL
BINAURAL SIGNAL
MICROPHONE
HEADPHONES
MICROPHONE
HEADPHONES
306
308
306
308

FIG. 4

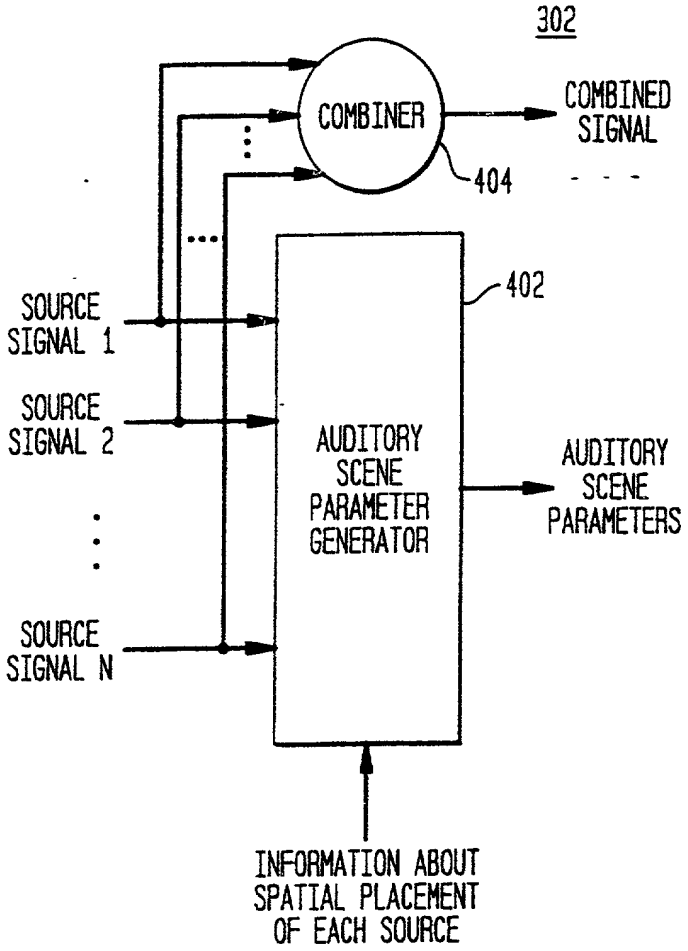

302
COMBINER
COMBINED SIGNAL
404
402
SOURCE SIGNAL 1
SOURCE SIGNAL 2
SOURCE SIGNAL N
AUDITORY SCENE PARAMETER GENERATOR
AUDITORY SCENE PARAMETERS
INFORMATION ABOUT SPATIAL PLACEMENT OF EACH SOURCE

FIG. 5

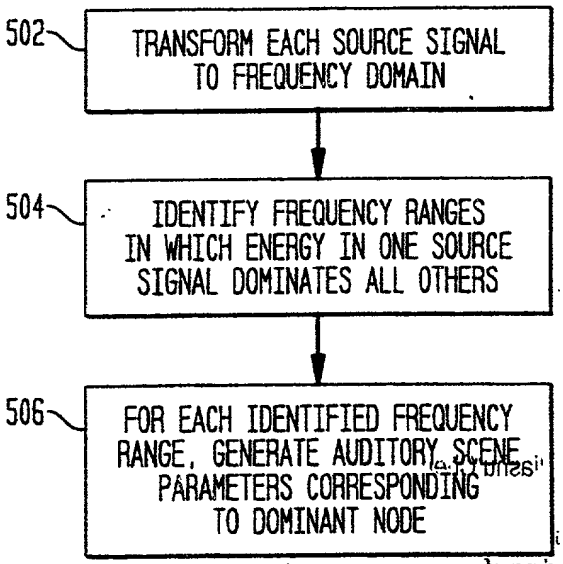

502
TRANSFORM EACH SOURCE SIGNAL TO FREQUENCY DOMAIN
504
IDENTIFY FREQUENCY RANGES IN WHICH ENERGY IN ONE SOURCE SIGNAL DOMINATES ALL OTHERS
506
FOR EACH IDENTIFIED FREQUENCY RANGE, GENERATE AUDITORY SCENE PARAMETERS CORRESPONDING TO DOMINANT NODE

FIG. 6

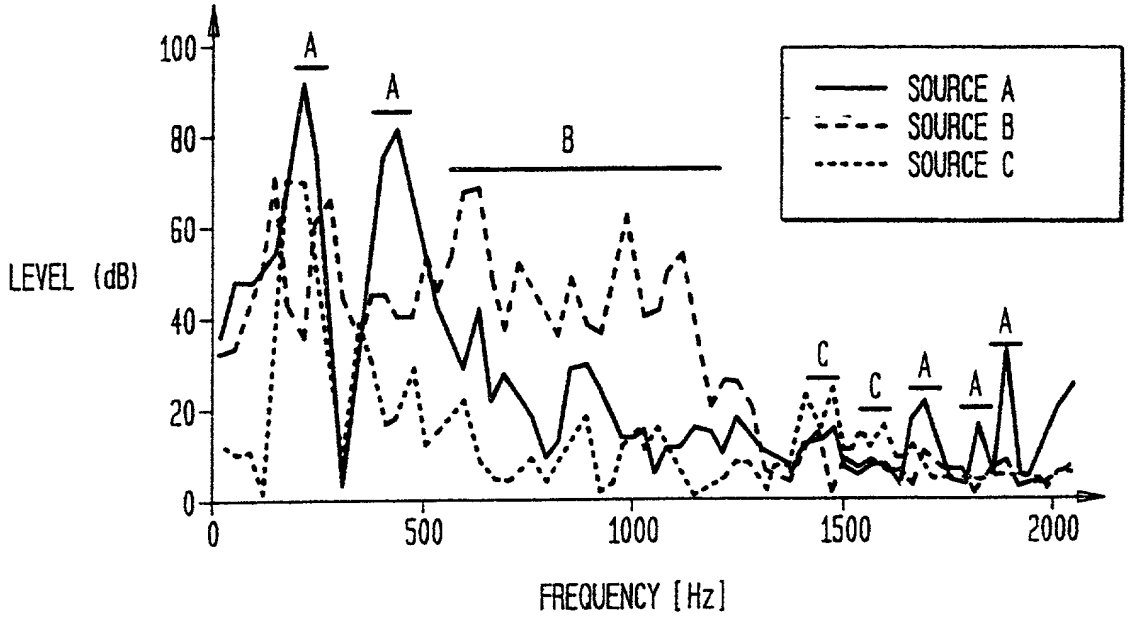

100
80
60
40
20
0
LEVEL (dB)
A
A
B
C
C
A
A
A
SOURCE A
SOURCE B
SOURCE C
0
500
1000
1500
2000
FREQUENCY [Hz]

FIG. 8

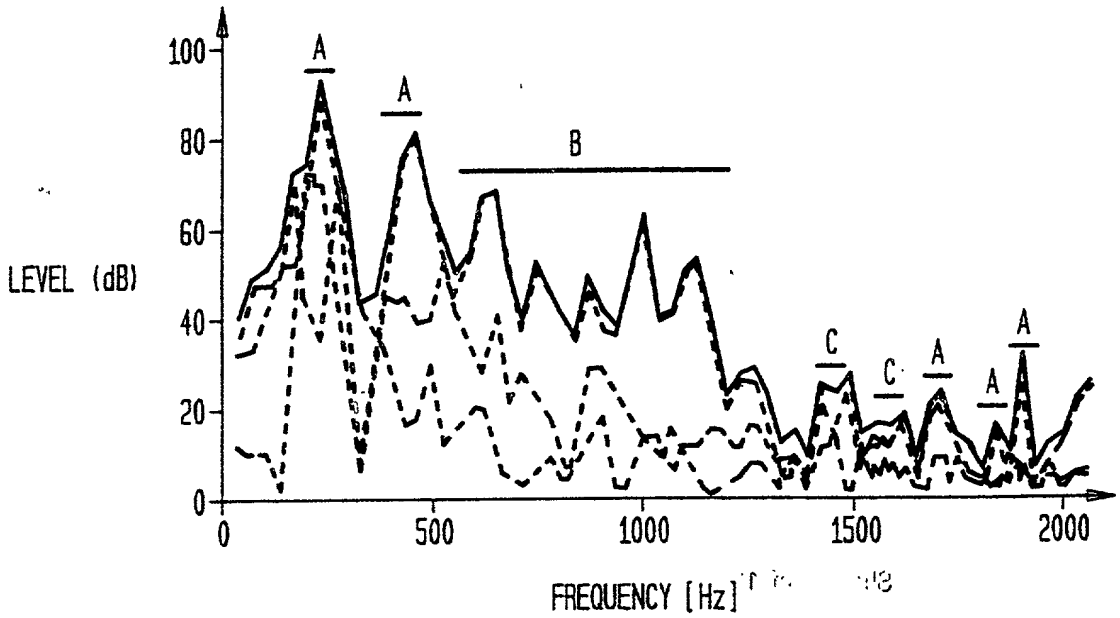

100
80
60
40
20
0
LEVEL (dB)
A
A
B
C
C
A
A
A
0
500
1000
1500
2000
FREQUENCY [Hz]

FIG. 7

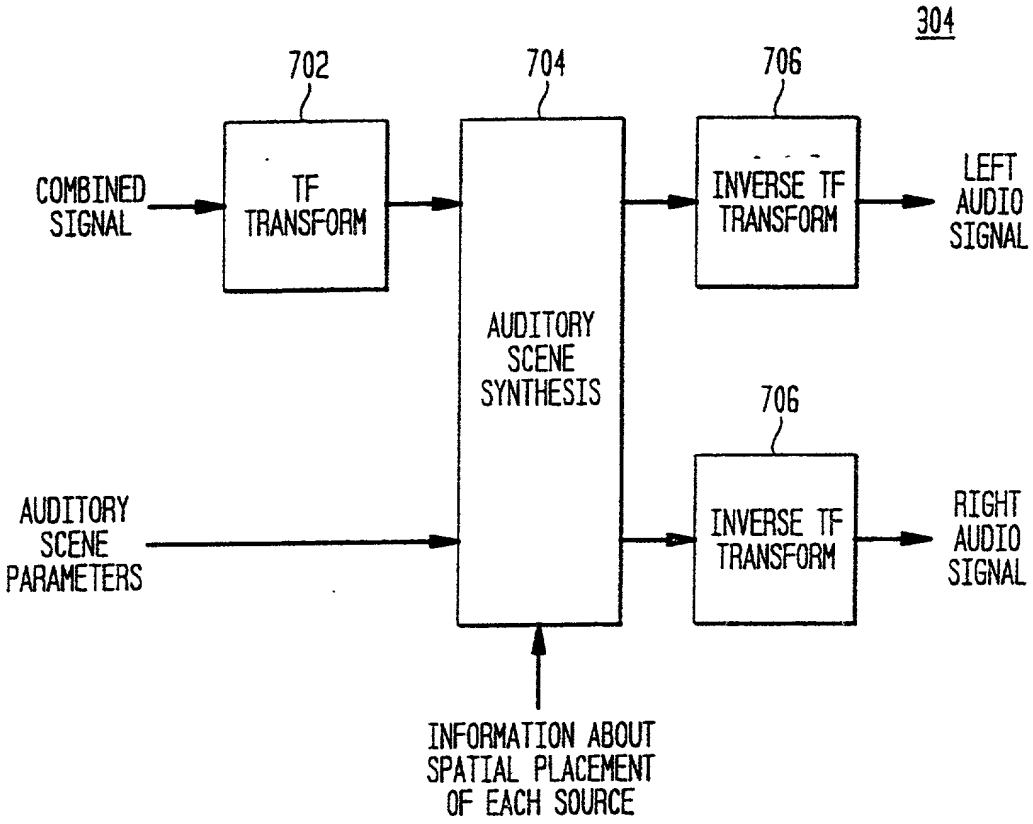

304
702
704
706
COMBINED SIGNAL
TF TRANSFORM
AUDITORY SCENE SYNTHESIS
INVERSE TF TRANSFORM
LEFT AUDIO SIGNAL
706
AUDITORY SCENE PARAMETERS
INVERSE TF TRANSFORM
RIGHT AUDIO SIGNAL
INFORMATION ABOUT SPATIAL PLACEMENT OF EACH SOURCE

FIG. 9

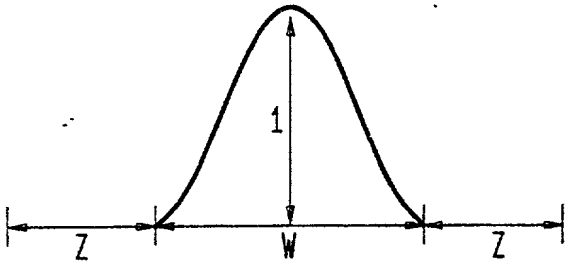

1
Z
W
Z

FIG. 10

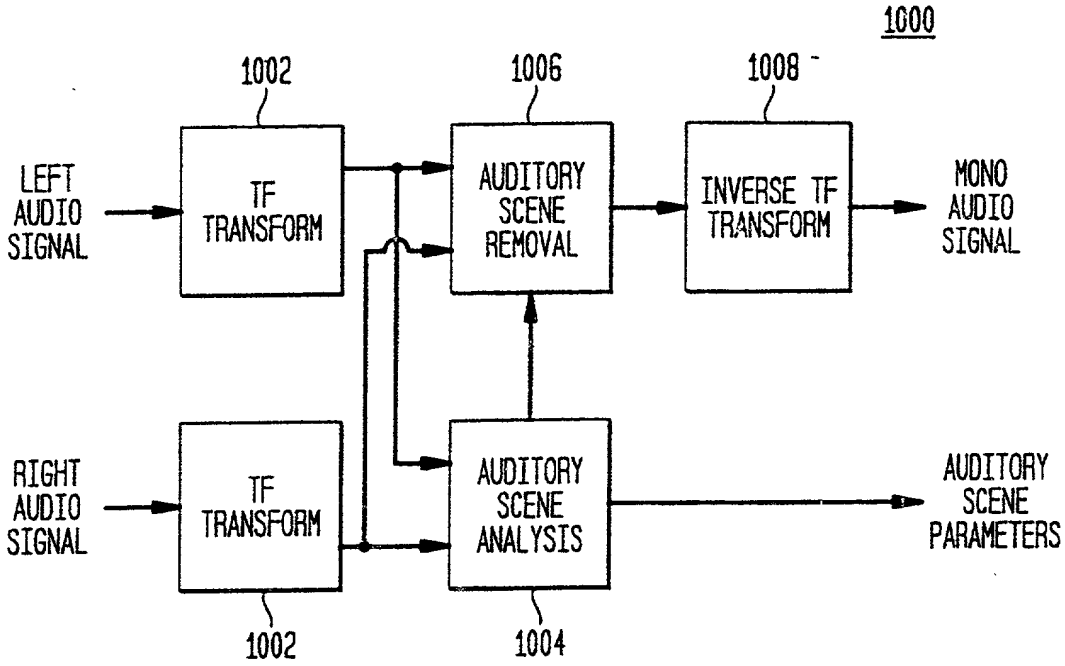

1000
1002
1006
1008
LEFT AUDIO SIGNAL
TF TRANSFORM
AUDITORY SCENE REMOVAL
INVERSE TF TRANSFORM
MONO AUDIO SIGNAL
RIGHT AUDIO SIGNAL
TF TRANSFORM
AUDITORY SCENE ANALYSIS
AUDITORY SCENE PARAMETERS
1002
1004

FIG. 11

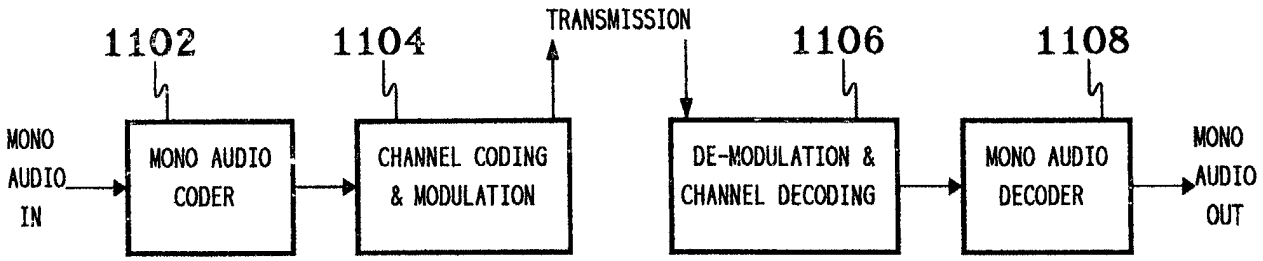

1100
1102
1104
TRANSMISSION
1106
1108
MONO AUDIO IN
MONO AUDIO CODER
CHANNEL CODING & MODULATION
DE-MODULATION & CHANNEL DECODING
MONO AUDIO DECODER
MONO AUDIO OUT

FIG. 12

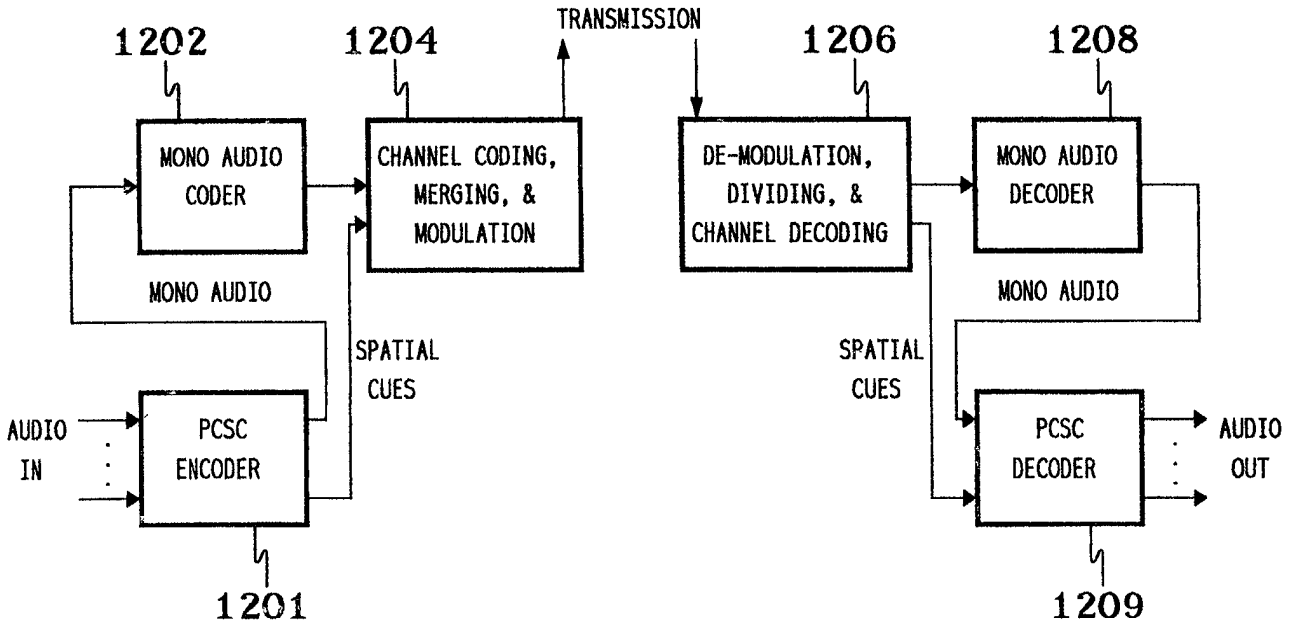

1200
1202
1204
TRANSMISSION
1206
1208
MONO AUDIO CODER
CHANNEL CODING, MERGING, & MODULATION
DE-MODULATION, DIVIDING, & CHANNEL DECODING
MONO AUDIO DECODER
MONO AUDIO
SPATIAL CUES
SPATIAL CUES
MONO AUDIO
AUDIO IN
PCSC ENCODER
PCSC DECODER
AUDIO OUT
1201
1209

FIG. 13

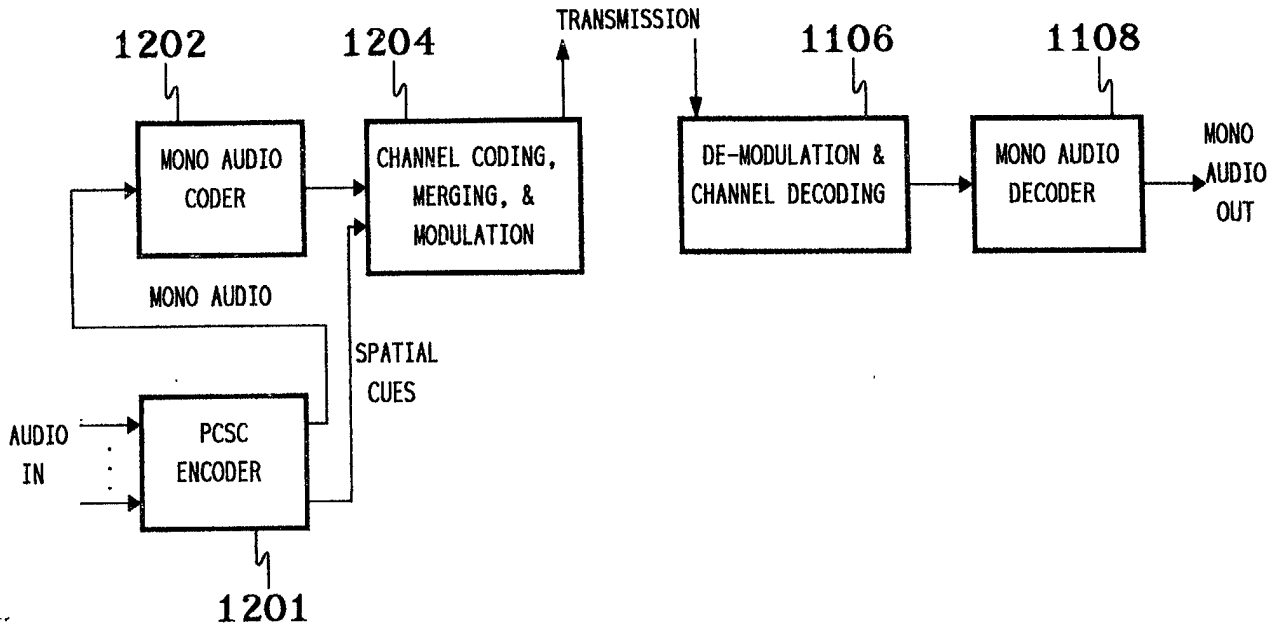

1300
1202
1204
TRANSMISSION
1106
1108
MONO AUDIO CODER
CHANNEL CODING, MERGING, & MODULATION
DE-MODULATION & CHANNEL DECODING
MONO AUDIO DECODER
MONO AUDIO OUT
MONO AUDIO
SPATIAL CUES
AUDIO IN
PCSC ENCODER
1201

FIG. 14

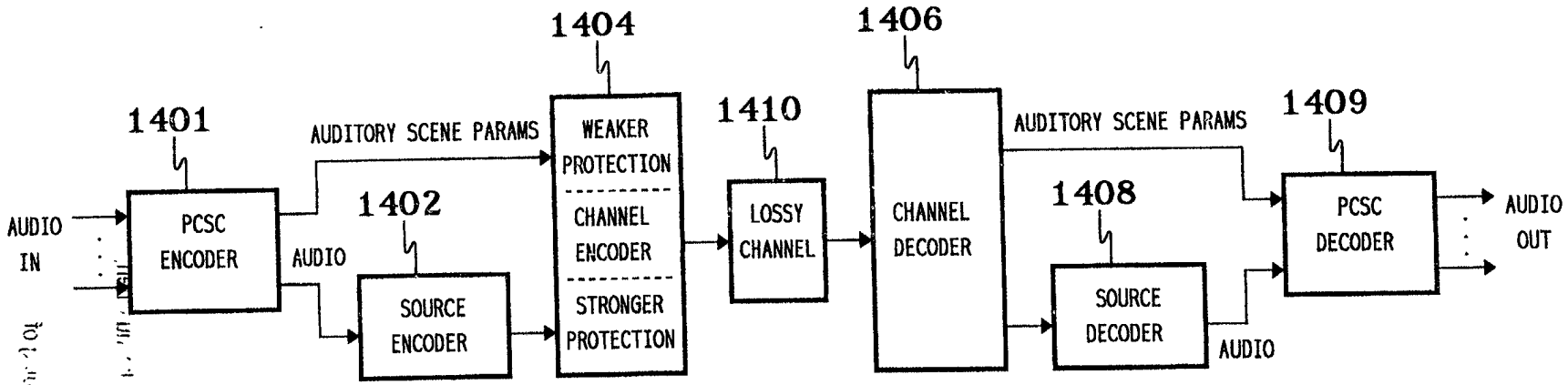
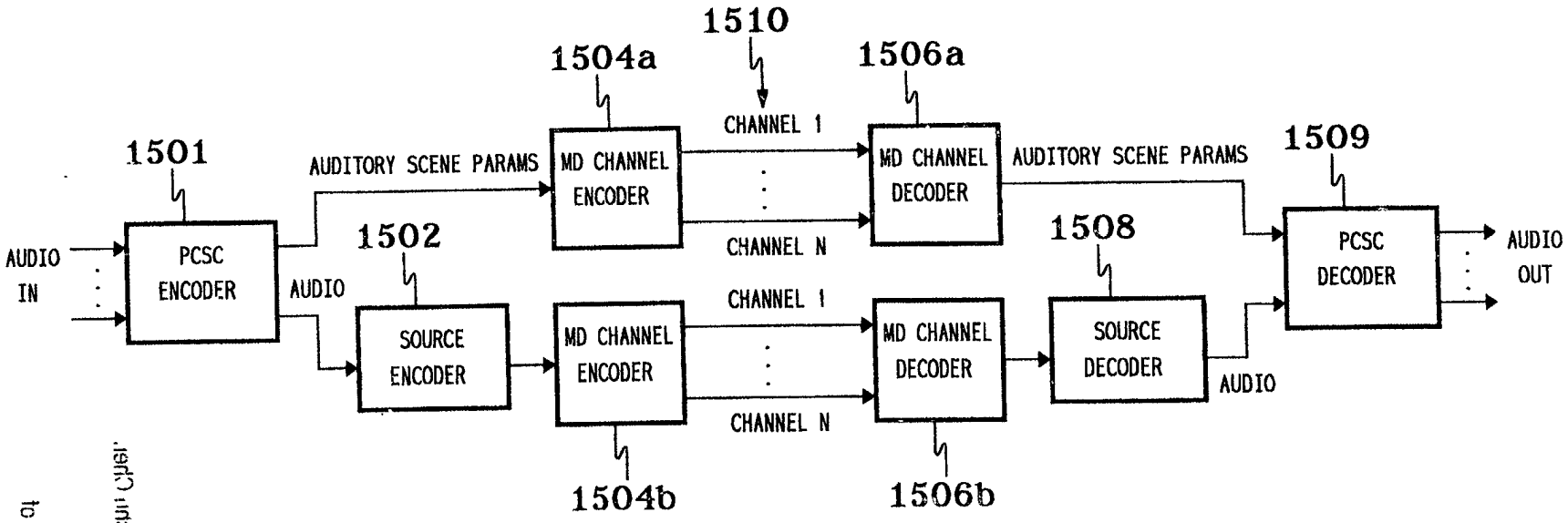

1400
1401
1402
1404
1406
1408
1409
1410
AUDIO IN
PCSC ENCODER
AUDITORY SCENE PARAMS
AUDIO
SOURCE ENCODER
WEAKER PROTECTION
CHANNEL ENCODER
STRONGER PROTECTION
LOSSY CHANNEL
CHANNEL DECODER
AUDITORY SCENE PARAMS
SOURCE DECODER
AUDIO
PCSC DECODER
AUDIO OUT

FIG. 15


1500
1510
1504a
1506a
1501
AUDITORY SCENE PARAMS
MD CHANNEL ENCODER
CHANNEL 1
MD CHANNEL DECODER
AUDITORY SCENE PARAMS
1509
1502
1508
AUDIO IN
PCSC ENCODER
AUDIO
SOURCE ENCODER
MD CHANNEL ENCODER
CHANNEL 1
MD CHANNEL DECODER
SOURCE DECODER
AUDIO
PCSC DECODER
AUDIO OUT
CHANNEL N
CHANNEL N
1504b
1506b